## REMARKS

In response to the Office Action mailed February 27, 2006, the applicants respectfully requests reconsideration. In the Office Action, claims 1-5, 7-10, 12-17 and 19-23 were rejected and claims 6, 11 and 18 were objected to. By this amendment, claims 1, 6, 9, 10, 13, 18 and 21 have been amended. Claims 1-24 remain pending in the application.

### Claim Rejections Under 35 U.S.C. §102

Claims 1, 2, 6-8, 13, 14 and 18-20 were rejected under 35 U.S.C. §102(b) as being anticipated by Kates et al. (US-6,137,267). This rejection is respectfully traversed, as Kates does not teach every element of the invention recited in claims 1, 2, 6-8, 13, 14 and 18-20, as is required for a proper rejection under 35 U.S.C. §102.

Kates discloses a system for controlling reverse current and current overshoot in a battery charging device. While Kates does teach controlling reverse current and current overshoot, he does it in a very different way and for different reasons than the system described in applicants' specification and recited in the claims.

Independent claim 1 recites a power supply system comprising:

a power supply;

a load coupled to the power supply via a power supply line to receive a voltage therefrom;

a circuit protection device comprising:

at least one switch device coupled between the power supply and the load on the power supply line;

a first controller coupled to the at least one switch for:

A. monitoring current flow through the at least one switch;

B. maintaining the at least one switch in an ON state while current flows through the at least one switch in a first direction; and

C. causing the at least one switch to toggle to an OFF state if current flowing through the at least one switch flows in a second direction; and

a second controller coupled to the power supply line between the power supply and the at least one switch and coupled to the at least one switch for sensing an amount of



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current flowing between the power supply and the at least one switch and causing the at least one switch to toggle to the OFF state when the current sensed by the second controller exceeds a reference value.

Among other features recited in independent claim 1, Kates does not teach a first controller coupled to the at least one switch for:

A. monitoring current flow through the at least one switch;

B. maintaining the at least one switch in an ON state while current flows through the at least one switch in a first direction; and

C. causing the at least one switch to toggle to an OFF state if current flowing through the at least one switch flows in a second direction.

Kates prevents reverse current flow by boosting the current on the supply line when the system detects that the current is interrupted or falls below a predetermined value. See Kates col. 8, lines 7-38. More specifically, as stated in col. 8, lines 27-29, "Thus, current is not allowed to fall below the threshold of transistor 564, thereby preventing reverse current in switching voltage regulator 100."

First, Kates does not monitor current flow through his switch, which the examiner has referred to as Q1. As set forth in col. 5, line 40, Kates' system senses the inductor current. Kates does not teach, and is not configured to monitor current flow through transistor Q1. Second, Kates does not maintain his switch in an ON state while current flows through the switch in a first direction. As set forth in col. 5, lines 10-18, MOSFETs 102 (Q1) and 104 are alternately turned ON and OFF to supply an alternating current to the load. Therefore, Kates switches Q1 ON and OFF without concern about the direction of flow of the current. Third, Kates does not cause the switch Q1 to toggle to an OFF state if current flowing through the switch flows in a second direction. As set forth above, Kates does not monitor the current flowing through the switch Q1. Furthermore, in the event of a reverse current, Kates does not toggle the switch Q1 to an OFF state to prevent the reverse current. As set forth above, in the event of a potential reverse current, Kates *boosts* the current to prevent the reverse current from occurring.

Furthermore, Kates does not teach a second controller coupled to the power supply line between the power supply and the at least one switch and coupled to the at least one switch for sensing an amount of current flowing between the power supply and



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the at least one switch and causing the at least one switch to toggle to the OFF state when the current sensed by the second controller exceeds a reference value, as recited in independent claim 1.

As set forth in col. 7, lines 20-22, Kates prevents current overshoot by using power, voltage and current feedback *from the load* to limit the charging voltage. The power, voltage and current feedback are provided to Kates' circuit 502 from the load 400 via DATA line 506 and CLOCK line 508, col. 7, lines 22-25. Based on this feedback from the load, Kates generates an error voltage signal 536, col. 7, lines 52-56. This error signal 536 is used to determine the *duty cycle* of the driver control circuit 128 so that the output current approaches the steady state current value with little or no overshoot, col. 7, line 67-col. 8, line 4.

Therefore, Kates' system acts to prevent a current overshoot based on feedback from the load, and not based on a determination of the "amount of current flowing between the power supply and the at least one switch," as recited in independent claim 1. Furthermore, Kates does not teach "causing the at least one switch to toggle to the OFF state when the current sensed by the second controller exceeds a reference value." Since Kates does not sense "an amount of current flowing between the power supply and the at least one switch," he cannot cause "the at least one switch to toggle to the OFF state when the current sensed by the second controller exceeds a reference value."

Accordingly, since Kates does not teach every element recited in independent claim1, independent claim 1 is allowable over Kates and the rejection of independent claim 1 under 35 U.S.C. §102 should be withdrawn.

Claims 2-12 depend from independent claim 1 and are allowable for at least the same reasons as independent claim 1.

Independent claim 13 recites a power supply system comprising:

a power supply;

a load coupled to the power supply via a power supply line to receive a voltage therefrom;

at least one switch device coupled between the power supply and the load on the power supply line;



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a first controller coupled to the at least one switch for causing the at least one switch to toggle to an OFF state if current flowing through the at least one switch flows in a direction opposite a normal operating current direction; and

a second controller coupled to the power supply line between the power supply and the at least one switch and coupled to the at least one switch for sensing an amount of current flowing between the power supply and the at least one switch and causing the at least one switch to toggle to the OFF state when the current sensed by the second controller exceeds a reference value.

As set forth above, Kates does not teach monitoring current flow through his switch, Q1. As set forth in col. 5, line 40, Kates' system senses the inductor current. Kates does not teach, and is not configured to monitor current flow through transistor Q1. Second, Kates does not cause "the at least one switch to toggle to an OFF state if current flowing through the at least one switch flows in a direction opposite a normal operating current direction." As set forth above, in the event of a potential reverse current, Kates *boosts* the current to prevent the reverse current from occurring, he does not manipulate his switch to prevent a reverse current situation.

Furthermore, Kates does not teach a second controller coupled to the power supply line between the power supply and the at least one switch and coupled to the at least one switch for sensing an amount of current flowing between the power supply and the at least one switch and causing the at least one switch to toggle to the OFF state when the current sensed by the second controller exceeds a reference value, as recited in independent claim 13.

As set forth in col. 7, lines 20-22, Kates prevents current overshoot by using power, voltage and current feedback *from the load* to limit the charging voltage. The power, voltage and current feedback are provided to Kates' circuit 502 from the load 400 via DATA line 506 and CLOCK line 508, col. 7, lines 22-25. Based on this feedback from the load, Kates generates an error voltage signal 536, col. 7, lines 52-56. This error signal 536 is used to determine the *duty cycle* of the driver control circuit 128 so that the output current approaches the steady state current value with little or no overshoot, col. 7, line 67-col. 8, line 4.



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Therefore, Kates' system acts to prevent a current overshoot based on feedback from the load, and not based on a determination of the "amount of current flowing between the power supply and the at least one switch," as recited in independent claim 13. Furthermore, Kates does not teach "causing the at least one switch to toggle to the OFF state when the current sensed by the second controller exceeds a reference value." Since Kates does not sense "an amount of current flowing between the power supply and the at least one switch," he cannot cause "the at least one switch to toggle to the OFF state when the current sensed by the second controller exceeds a reference value."

Accordingly, since Kates does not teach every element recited in independent claim13, independent claim 13 is allowable over Kates and the rejection of independent claim 13 under 35 U.S.C. §102 should be withdrawn.

Claims 14-21 depend from independent claim 13 and are allowable for at least the same reasons as independent claim 13.

Independent claim 22 recites a method of providing fault protection in a power supply system, the method comprising:

A. monitoring a current flowing from a power supply to a load via a power supply line;

B. toggling a switch device coupled between the power supply and the load in the power supply line from an ON state to an OFF state when the current begins to flow from the load to the power supply;

C. monitoring the amplitude of the current flowing in the power supply line; and

D. toggling the switch device from the ON state to the OFF state when the amplitude of the current in the power supply line exceeds a reference value.

As set forth above, Kates does not teach "toggling a switch device coupled between the power supply and the load in the power supply line from an ON state to an OFF state when the current begins to flow from the load to the power supply." In order to prevent a reverse current, Kates does not toggle his switch device from an ON state to an OFF state if current flowing through the switch flows in a second direction. As set forth above, Kates does not monitor the current flowing through the switch Q1. In the event of a reverse current, Kates does not toggle the switch Q1 to an OFF state when the



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current begins to flow from the load to the power supply. As set forth above, in the event of a potential reverse current, Kates *boosts* the current to prevent the reverse current from occurring.

Furthermore, Kates does not teach monitoring the amplitude of the current flowing in the power supply line and toggling a switch device from the ON state to the OFF state when the amplitude of the current in the power supply line exceeds a reference value. As set forth above, Kates prevents current overshoot by using power, voltage and current feedback *from the load* to limit the charging voltage. Based on this feedback from the load, Kates generates an error voltage signal 536 which is used to determine the *duty cycle* of the driver control circuit 128 so that the output current approaches the steady state current value with little or no overshoot, col. 7, line 67-col. 8, line 4.

Therefore, Kates' system acts to prevent a current overshoot based on feedback from the load, and not based on a determination of the "the amplitude of the current flowing in the power supply line," as recited in independent claim 22. Furthermore, Kates does not teach "toggling the switch device from the ON state to the OFF state when the amplitude of the current in the power supply line exceeds a reference value.." Since Kates does not "monitor[ing] the amplitude of the current flowing in the power supply line," he cannot "toggle[ing] the switch device from the ON state to the OFF state when the amplitude of the current in the power supply line exceeds a reference value."

Accordingly, since Kates does not teach every element recited in independent claim 22, independent claim 22 is allowable over Kates and the rejection of independent claim 22 under 35 U.S.C. §102 should be withdrawn.

Independent claim 23 recites a fault protection system, comprising:

means for monitoring a current flowing from a power supply to a load via a power supply line;

means for toggling a switch device coupled between the power supply and the load in the power supply line from an ON state to an OFF state when the current begins to flow from the load to the power supply;

means for monitoring the amplitude of the current flowing in the power supply line; and



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means for toggling the switch device from the ON state to the OFF state when the amplitude of the current in the power supply line exceeds a reference value.

As set forth above, Kates does not teach "toggling a switch device coupled between the power supply and the load in the power supply line from an ON state to an OFF state when the current begins to flow from the load to the power supply." In order to prevent a reverse current, Kates does not toggle his switch device from an ON state to an OFF state if current flowing through the switch flows in a second direction. As set forth above, Kates does not monitor the current flowing through the switch Q1. In the event of a reverse current, Kates does not toggle the switch Q1 to an OFF state when the current begins to flow from the load to the power supply. As set forth above, in the event of a potential reverse current, Kates *boosts* the current to prevent the reverse current from occurring.

Furthermore, Kates does not teach monitoring the amplitude of the current flowing in the power supply line and toggling a switch device from the ON state to the OFF state when the amplitude of the current in the power supply line exceeds a reference value. As set forth above, Kates prevents current overshoot by using power, voltage and current feedback *from the load* to limit the charging voltage. Based on this feedback from the load, Kates generates an error voltage signal 536 which is used to determine the *duty cycle* of the driver control circuit 128 so that the output current approaches the steady state current value with little or no overshoot, col. 7, line 67-col. 8, line 4.

Therefore, Kates' system acts to prevent a current overshoot based on feedback from the load, and not based on a determination of the "the amplitude of the current flowing in the power supply line," as recited in independent claim 23. Furthermore, Kates does not teach "toggling the switch device from the ON state to the OFF state when the amplitude of the current in the power supply line exceeds a reference value.." Since Kates does not "monitor[ing] the amplitude of the current flowing in the power supply line," he cannot "toggle[ing] the switch device from the ON state to the OFF state when the amplitude of the current in the power supply line exceeds a reference value."

Accordingly, since Kates does not teach every element recited in independent claim 23, independent claim 23 is allowable over Kates and the rejection of independent claim 23 under 35 U.S.C. §102 should be withdrawn.



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Claim Rejections Under 35 U.S.C. §103

Claims 2-5, 8-10, 14-17, 20 and 21 were rejected under 35 U.S.C. §103(a) as being unpatentable over Kates et al. in view of the Maxim Data Sheet 19-2735, Rev 0, 1/03. This rejection is respectfully traversed.

Claims 2-5 and 8-10 depend from independent claim 1, and claims 14-17, 20 and 21 depend from independent claim 13. Since claims 1 and 13 are allowable over the art of record, as set forth above, applicants assert that the rejection under 35 U.S.C. §103(a) is moot and should be withdrawn.

Allowable Subject Matter

Applicant acknowledges and appreciates the examiners indication that claims 6, 11 and 18 would be allowable if rewritten in independent form. However, since the claims from which these claims depend are allowable, applicant asserts that amending these claims is not necessary.

Based on the foregoing, applicants respectfully assert that claims 1-23 are allowable over the art of record and respectfully request that a timely Notice of Allowance be issued in this application.

In the event the Patent Office deems personal contact desirable in disposition of this matter, the Office is invited to contact the undersigned attorney at (508) 293-7835.

Please charge any fees occasioned by this submission to Deposit Account No. 05-0889.

Respectfully submitted,

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